

Attorney Docket No. 020722

REMARKS

Claims 19-24 and 26-50 are pending in the present application after entry of this amendment. In the above amendments, claim 19 has been amended, claims 1-18 and 25 has been cancelled, and claims 26-50 have been added. Applicants believe that the present application is now in condition for allowance, which prompt and favorable action is respectfully requested.

I. REJECTION UNDER 35 U.S.C. §112

The Examiner rejected claims 19-24 under 35 U.S.C. §112, second paragraph, as being allegedly indefinite because the term "the plurality of transmit antennas" in line 7 of claim 19 lacks antecedent basis. Claim 19 has been amended to recite "a plurality of transmit antennas," and the rejection is respectfully traversed.

II. REJECTION UNDER 35 U.S.C. §102

The Examiner rejected claims 1-5, 13-20, 22, and 25 under 35 U.S.C. §102(e) as allegedly being anticipated by Foschini (US Patent Application Publication No. 20020142723). This rejection is respectfully traversed.

Claims 1-5, 13-18, and 25 have been cancelled and therefore the rejection with respect to claims 1-5, 13-18, and 25 is now moot.

Foschini discloses "multiple-input, multiple output wireless communication system 100 having four transmit antennas 105-1, 105-2, 105-3, and 105-4 and three receive antennas 110-1, 110-2, and 110-3." (Paragraph 30, lines 1-4). In order "to separate out and decode the sub-streams, different combined-weighted-(remaining)-received-signals of receive antenna signals can be formed, the weights used to form any particular combination being such as to maximize the signal-to-noise ratio of a respective one of the signals 135-1, 135-2, 135-3, and 135-4." (Paragraph 37, lines 1-6). To obtain the weights,

"channel characteristics may be determined by receiver 155 during a training phase during which known signals are transmitted on each transmit antenna 105-1 through 105-4. These known signals are processed at receiver 155 to provide accurate estimates of the channel characteristics, i.e. the h_{nm} 's, of the channels between the transmit and receive antennas. The channel characteristics change over time and,

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therefore, there is typically a training phase at the start of each burst.”
(Paragraph 33, lines 3-11).

Claim 19 recites, amongst other things, that “the plurality of streams of received symbols are received at approximately the same time” and that “processing the plurality of streams of received symbols to recover the at least one stream of transmitted symbols utilizing an interference estimation from another stream of the plurality of streams.” As shown above, Foschini utilizes a training phase to set weights which are later used for decoding each data stream which is sent during a different time period and does not use an interference estimation from another stream of the plurality of streams that are received at approximately the same time as each other to process the another stream as recited in claim 1.

Therefore, for at least this reason, claim 19 is allowable over Foschini.

Claims 20 and 22 depend from claim 19 and are allowable for at least the same reasons as those stated with respect to claim 19.

Therefore, Applicants respectfully request a withdrawal of the rejection under 35 U.S.C. §102(e) for at least the foregoing reasons.

III. REJECTION UNDER 35 U.S.C. §103

a. Claims 6-10, 21, and 23

The Examiner rejected claims 6-10, 21, and 23 under 35 U.S.C. §103(a) as allegedly being unpatentable over Foschini in view of Ko (US Patent No. 6,744,813). This rejection is respectfully traversed in its entirety.

Claims 6-10 have been cancelled and therefore the rejection with respect to claims 6-10 is now moot.

Claims 21 and 23 depend from claim 19 and are allowable as depending on allowable base claim.

b. Claims 11-12 and 24

The Examiner rejected claims 11-12 and 24 under 35 U.S.C. §103(a) as allegedly being unpatentable over Foschini in view of Ko. This rejection is respectfully traversed in its entirety.

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Claims 11-12 have been cancelled and therefore the rejection with respect to claims 11-12 is now moot.

Claim 24 depends from claim 19 and is allowable as depending on allowable base claim.

IV. NEW CLAIMS 26-50

New independent claim 26 recites, amongst other things, a "processor comprising an interference cancellation unit configured to receive a data stream received at the at least two antennas and a decoded data stream generated by the processor." Neither Foschini nor Ko discloses or describes an interference cancellation unit, which is part of the processor, coupled to both a data stream received at multiple antennas and a decoded data stream generated by the processor. Therefore, for at least this reason, claim 26 is allowable over Foschini, Ko, and the combination thereof.

Claims 27-34 depend from claim 26 and are allowable for at least the same reason as discussed with respect to claim 26.

New independent claim 35 recites, amongst other things, that "a processor equalizes a plurality of streams of received symbols," then "recovers transmitted symbols in the first stream and estimates an interference based upon the transmitted symbols that were recovered," and "performs cancellation upon a second stream of the plurality of streams based upon the estimated interference to recover a second group of symbols." Foschini does not disclose a processor that estimates interference based upon a first data stream that has been decoded and then utilizes that estimated interference to cancel signals in a second stream of transmitted data based upon the estimated interference to recover a second group of symbols from another data stream of the plurality of data streams. Therefore, for at least this reason, claim 35 is allowable over Foschini, Ko, and the combination thereof.

Claims 36-40 depend from claim 35 and are allowable for at least the same reason as discussed with respect to claim 35.

New independent claim 41 recites, amongst other things, "means for recovering first data symbols from the first data stream," "means for estimating interference based upon the first data symbols and generating an estimated interference," and "means for performing cancellation on a second data stream of the plurality of data streams based

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upon the estimated interference." Neither Foschini nor Ko discloses or describes performing cancellation on a second data stream based upon the estimated interference of the first data stream, from which data symbols were recovered, of the same plurality of data streams. Therefore, for at least this reason, claim 42 is allowable over Foschini, Ko, and the combination thereof.

Claims 42-46 depend from claim 41 and are allowable for at least the same reason as discussed with respect to claim 41.

New independent claim 47 recites, amongst other things, "recovering first data symbols from a first data stream of the plurality of data streams," then "estimating an interference based upon the first data symbols", and then "canceling the interference estimated from a second data stream of the plurality of data streams." As discussed with respect to claim 47, neither Foschini nor Ko discloses or describes canceling the interference estimated from a second data stream of the plurality of data streams, where the interference estimated is from a first data stream of the same plurality of data streams. Therefore, for at least this reason, claim 47 is allowable over Foschini, Ko, and the combination thereof.

Claims 48-50 depend from claim 47 and are allowable for at least the same reason as discussed with respect to claim 47.

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CONCLUSION


In light of the amendments contained herein, Applicants submit that the application is in condition for allowance, for which early action is requested. If the Examiner would like to further discuss this matter or any issue, he is invited to contact the undersigned at (858) 845-0130.

Please charge any fees or overpayments that may be due with this response to Deposit Account No. 17-0026.

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Respectfully submitted,

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